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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,508	05/11/2004	Chih-Chuan Cheng	11818-US-PA	3507

31561 7590 03/01/2007
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER	
CONNOLLY, MARK A	
ART UNIT	PAPER NUMBER
2115	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/709,508

Applicant(s)

CHENG ET AL.

Examiner

Mark Connolly

Art Unit

2115

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-8 have been presented for examination.
2. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1 and 5-8 are rejected under 35 U.S.C. 102(a) as being anticipated by Fang¹.
5. Referring to claim 1, Fang teaches the method for dynamically adjusting frequency of a CPU comprising:

a. providing a translation table, comprising a plurality of layers, each layer defining a corresponding front-side bus (FSB) operation frequency and a corresponding range of central processing unit [CPU] usage rate [col. 2 lines 22-28, col. 4 lines 31-38 and col. 5 lines 24-30]. Each frequency/voltage vs. CPU load table entry is interpreted as a layer.

In addition, Fang inherently teaches a range of CPU usage rate. In particular, Fang provides an example where a CPU load is determined to be 19%. This value is then compared in a table in order to adjust the working frequency (which comprises changing an FSB frequency). Although it is unclear as to whether 19% fell within a “range” of CPU load values (i.e. 10%-20% LOAD = 100MHz FSB and 20%-30% LOAD =

¹ As cited on the previous office action.

200MHz FSB etc...) or if the table has specific entries for each specific CPU load percentage (i.e. 19% LOAD = 90 MHz FSB and 20% LOAD = 100 MHz FSB etc...), in either case it is irrelevant. The claim does not limit the range as having to span a plurality of values. Therefore, because the table taught in Fang inherently defines a span comprising at least a single load percentage per table entry, it is interpreted that the table in Fang inherently defines a range of CPU usage rates.

b. obtaining a current usage rate of the central processing unit [col. 4 lines 31-38].

c. comparing the current usage rate with entries in the translation table and adjusting one of the front-side frequencies [col. 2 lines 22-27 and col. 4 lines 31-38].

6. Claims 5 and 6, Fang teaches measuring CPU usage rate using operating system software [col. 4 lines 15-17].

7. Referring to claims 7 and 8, Fang teaches adjusting the front-side bus in accordance with a CPU usage rate [abstract and col. 1 lines 23-38]. Therefore, if the CPU usage increases or decreases, the front-side bus frequency increases and decreases accordingly.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fang as applied to claims 1 and 5-8 above.

10. Referring to claim 4, although Fang teaches a table comprising a plurality of entries, it is not explicitly taught that the intervals for the frequencies between each entry are 1MHz. It is well known in the art that tables can be setup and implemented in a plurality of different ways. Furthermore, it should be apparent that as the range of CPU usages in the table decrease or increase for each layer, the control over the front-side bus frequency would either become tighter or looser. For example, a table breaking up the CPU usage into four ranges (e.g. 0-25%, 25-50%, 50-75% and 75-100%) could only specify four different FSB frequencies. On the other hand, a table breaking up the CPU usage into 10 ranges (e.g. 0-10%, 10-20% etc...) would allow additional FSB frequencies to be specified thus providing the system more accurate control over the FSB frequency thus providing tighter control over the power consumed by the FSB. It would have been obvious by design choice to adjust the CPU usage range for each layer to tightly control bus frequency so that the frequency difference between each layer is only 1 MHz because this would provide very tight control over the FSB frequency thus maximizing power savings.

11. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fang as applied to claims 1 and 4-8 above, and further in view of Pillay².

12. Referring to claim 2, Fang teaches establishing a plurality of layers according to the clocking range, wherein the translation table is defined for the front-side operation frequency of the CPU vs. a usage rate [col. 5 lines 24-30]. Although Fang teaches adjusting the front-side bus frequency, it is not explicitly taught that the frequency is adjusted progressively. Pillay teaches adjusting a clock frequency in small steps in response to a change in processor load [col. 11 lines

² As cited on the previous office action.

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17-37]. It would have been obvious to one of ordinary skill in the art to progressively adjust the front-side bus frequency taught in Fang because it would help ensure stability of the system as taught by Pillay.

13. Referring to claim 3, Fang teaches operating at a higher working frequency when external power is supplied and operating at a lower working frequency when battery power is supplied in order to conserve the battery power [col. 1 lines 40-46].

Response to Arguments

14. After further consideration of the Fang reference, the examiner has withdrawn the obviousness rejections under 35 U.S.C. 103(a) for claims 1 and 4-8 over Fang in view of Oh and has presented a new grounds of rejection for claims 1 and 5-8 under 35 U.S.C. 102(a) and claim 4 under 35 U.S.C. 103(a) over Fang alone.

15. In response to the argument that Fang alone fails to teach a range of a CPU usage rate, Fang provides an example where a CPU load is determined to be 19%. This value is then compared in a table in order to adjust the working frequency (which comprises changing an FSB frequency). The fact that a comparison is made inherently suggests that the table comprises multiple entries from which to compare to. Although it is unclear as to whether the 19% usage rate fell within a “range” of CPU load values (i.e. 10%-20% LOAD = 100MHz FSB and 20%-30% LOAD = 200MHz FSB etc...) or if the table has specific entries for each CPU load percentage (i.e. 19% LOAD = 90 MHz FSB and 20% LOAD = 100 MHz FSB etc...); in either case it is irrelevant. The claim language does not limit the range as having to span a plurality of values. Therefore, because the table taught in Fang inherently defines a span comprising at least

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a single load percentage per table entry, it is interpreted that the table in Fang inherently defines a range of CPU usage rates.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Connolly whose telephone number is (571) 272-3666. The examiner can normally be reached on M-F 8AM-5PM (except every first Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas C. Lee can be reached on (571) 272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mark Connolly
Examiner
Art Unit 2115

mc
February 27, 2007

